

Claims

- [c1] A solid, multi-layer water treatment tablet comprising one discrete layer containing at least one halogen source and a second discrete layer containing at least one pH compensating source.
- [c2] The tablet of Claim 1, wherein the halogen source is acid in an aqueous solution and the pH compensating source is basic in aqueous solution.
- [c3] The tablet of Claim 1, wherein the halogen source is basic in an aqueous solution and the pH compensating source is acid in an aqueous solution.
- [c4] The tablet of Claim 2, wherein the halogen source is selected from the group consisting of trichloroisocyanuric acid, dichloroisocyanuric acid, monochloroisocyanuric acid, potassium dichloroisocyanuric acid, sodium dichloroisocyanuric acid dihydrate, anhydrous sodium dichloroisocyanuric acid, tribromoisocyanuric acid, dibromoisocyanuric acid, monobromoisocyanuric acid, monobromodichloroisocyanuric acid, dibromomonochloroisocyanuric acid, 1,3-dichloro-5, 5-dimethylhydantoin, 1,3-dibromo 5,5-dimethylhydantoin, 1-bromo-3-chloro-5,5-dimethylhydantoin, 1,3-dichloro-5-methyl-5-ethylhydantoin, 1,3-dichloro-5, 5-dimethylhydantoin, 1,3-dibromo-5,5-dimethylhydantoin, trichloromelamine, tribromomelamine and mixtures thereof.
- [c5] The tablet of Claim 3, wherein the halogen source is selected from the group consisting of calcium hypochlorite and lithium hypochlorite.
- [c6] The tablet of Claim 2, wherein the pH compensating source is selected from the group consisting of alkali metal or alkaline earth carbonates, alkaline or alkaline earth bicarbonates, an alkaline phosphate, an alkaline silicate, an alkaline borate and mixtures thereof.
- [c7] The tablet of Claim 6, wherein the alkali metal carbonate includes sodium carbonate.
- [c8] The tablet of Claim 6, wherein the alkali metal bicarbonate includes sodium bicarbonate.

[c9] The tablet of Claim 5, wherein the pH compensating source includes an alkali metal bisulfate.

[c10] The tablet of Claim 9, wherein the alkali metal bisulfate includes sodium bisulfate.

[c11] The tablet of Claim 1, wherein the halogen source comprises from about 5% to about 50%, by weight, of the tablet.

[c12] The tablet of Claim 1, wherein the halogen source includes trichloroisocyanuric acid and the pH compensating source includes sodium hypochlorite.

[c13] The tablet of Claim 1, wherein the halogen source includes one mole of trichloroisocyanuric acid and four moles of potassium dichloroisocyanuric acid.

[c14] The tablet of Claim 1, wherein the halogen source comprises about 60% by weight 1-bromo-3-chloro-dimethylhydantoin, about 30% by weight 1,3-dichloro 5,5 - dimethylhydantoin and about 10% by weight 1,3-dichloro-5-ethyl-5-methylhydantoin.

[c15] A solid, multi-layer water treatment tablet comprising, sequentially, one discrete layer comprising at least one halogen source and a second discrete layer comprising an inert boundary layer and a third layer comprising at least one pH compensating source.

[c16] The tablet of Claim 15, wherein the boundary layer comprises a material selected from the group consisting of alkali metal chlorides and alkali metal sulfates.

[c17] The tablet of Claim 15, wherein the boundary layer comprises an alkali metal chloride.

[c18] The tablet of Claim 17, wherein the alkali metal chloride includes sodium chloride.

[c19] The tablet of Claim 17, wherein the alkali metal sulfate includes sodium sulfate.

[c20] The tablet of Claim 15, wherein the halogen source is acidic in aqueous solution

and the pH compensating source is basic in aqueous solution.

- [c21] The tablet of Claim 15, wherein halogen source is basic in aqueous solution and the pH compensating source is acidic in aqueous solution.
- [c22] The tablet of Claim 20, wherein the halogen source is selected from the group consisting of trichloroisocyanuric acid, dichloroisocyanuric acid, monochloroisocyanuric acid, potassium dichloroisocyanuric acid, sodium dichloroisocyanuric acid dihydrate, anhydrous sodium dichloroisocyanuric acid, tribromoisocyanuric acid, dibromoisocyanuric acid, monobromoisocyanuric acid, monobromodichloroisocyanuric acid, dibromo-monochloroisocyanuric acid, 1,3-dichloro-5,5-dimethylhydantoin, 1,3-dibromo 5,5-dimethylhydantoin, 1-bromo-3-chloro-5,5-dimethylhydantoin, 1,3-dichloro-5-methyl-5-ethylhydantoin, 1,3-dichloro-5, 5-dimethylhydantoin, 1,3-dibromo-5,5-dimethylhydantoin, trichloromelamine, tribromomelamine and mixtures thereof.
- [c23] The tablet of Claim 21, wherein the halogen source is selected from the group selected from the group consisting of calcium hypochlorite and lithium hypochlorite.
- [c24] The tablet of Claim 20, wherein the pH compensating source is selected from the group consisting of alkali metal or alkaline earth carbonates, alkaline or alkaline earth bicarbonates, an alkaline phosphate, an alkaline silicate, an alkaline borate and mixtures thereof.
- [c25] The tablet of Claim 24, wherein the alkali metal carbonate includes sodium carbonate.
- [c26] The tablet of Claim 25, wherein the alkali metal bicarbonate includes sodium bicarbonate.
- [c27] The tablet of Claim 23, wherein the pH compensating source includes an alkali metal bisulfate.
- [c28] The tablet of Claim 15, wherein the alkali metal bisulfate includes sodium bisulfate.

- [c29] The tablet of Claim 15, wherein the halogen source comprises from about 5% to about 50%, by weight, of the tablet.
- [c30] The tablet of Claim 15, wherein the halogen source includes trichloroisocyanuric acid and the pH compensating source includes sodium hypochlorite.
- [c31] The tablet of Claim 15, wherein the halogen source comprises one mole of trichloroisocyanuric and four moles of potassium dichloroisocyanuric acid.
- [c32] The tablet of Claim 15, wherein the halogen source comprises about 60% by weight 1-bromo-3-chloro-dimethylhydantoin, about 30% by weight 1,3-dichloro-5,5-dimethylhydantoin and about 10% by weight 1,3-dichloro-5-ethyl-5-methylhydantoin.
- [c33] The method of treating a water system, which comprises adding to the water a tablet of Claim 1.
- [c34] The tablet of Claim 33, wherein the halogen source is acidic in an aqueous solution and the pH compensating source is basic in an aqueous solution.
- [c35] The tablet of Claim 34, wherein halogen source is basic in an aqueous solution and the pH compensating source is acidic in an aqueous solution.
- [c36] The tablet of Claim 34, wherein the halogen source is selected from the group consisting of trichloroisocyanuric acid, dichloroisocyanuric acid, monochloroisocyanuric acid, potassium dichloroisocyanuric acid, sodium dichloroisocyanuric acid dihydrate, anhydrous sodium dichloroisocyanuric acid, tribromoisocyanuric acid, dibromoisocyanuric acid, monobromoisocyanuric acid, monobromodichloroisocyanuric acid, dibromomonochloroisocyanuric acid, 1,3-dichloro-5,5-dimethylhydantoin, 1,3-dibromo 5,5-dimethylhydantoin, 1-bromo-3-chloro-5,5-dimethylhydantoin, 1,3-dichloro-5-methyl-5-ethylhydantoin, 1,3-dichloro-5, 5-dimethylhydantoin, 1,3-dibromo-5,5-dimethylhydantoin, trichloromelamine, tribromomelamine and mixtures thereof.
- [c37] The tablet of Claim 35, wherein the halogen source is selected from the group consisting of calcium hypochlorite and lithium hypochlorite.

[c38] The tablet of Claim 34, wherein the pH compensating source is selected from the group consisting of alkali metal or alkaline earth carbonates, alkaline or alkaline earth bicarbonates, an alkaline phosphate, an alkaline silicate, an alkaline borate, and mixtures thereof.

[c39] The tablet of Claim 38, wherein the alkali metal carbonate includes sodium carbonate.

[c40] The tablet of Claim 38, wherein the alkali metal bicarbonate includes sodium bicarbonate.

[c41] The tablet of Claim 37, wherein the pH compensating source includes an alkali metal bisulfate.

[c42] The tablet of Claim 41, wherein the alkali metal bisulfate is sodium bisulfate.

[c43] The tablet of Claim 33, wherein the halogen source includes from about 5% to about 50%, by weight, of the tablet.

[c44] The tablet of Claim 33, wherein the halogen source includes trichloroisocyanuric acid and the pH compensating source includes sodium hypochlorite.

[c45] The tablet of Claim 33, wherein the halogen source comprises one mole of trichloroisocyanuric acid and four moles of potassium dichloroisocyanuric acid.

[c46] The tablet of Claim 33, wherein the halogen source comprises about 60% by weight 1-bromo-3-chlorodimethylhydantoin, about 30% by weight 1,3 dichloro-5,5 dimethylhydantoin and about 10% by weight 1,3-dichloro-5-ethyl-5-methylhydantoin.